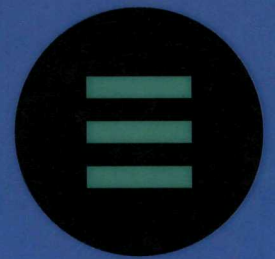


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5 Year Review Project Work Plan for the NL Industries/ Taracorp Superfund Site

Granite City, Illinois



ENTACT



LEADING

THE

NATION

IN

CUSTOMER

CARE

- Prepared for
NL Industries/Taracorp Superfund
Site Group
- Prepared by
ENTACT, Inc.
- March, 2003

EPA Region 5 Records Ctr.



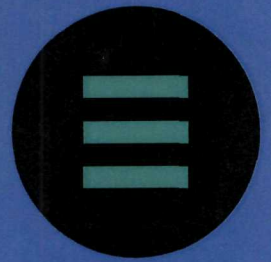
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**Residential
Areas &
Remote Fill
Locations**

5 Year Review Project Work Plan for the NL Industries/ Taracorp Superfund Site

Granite City, Illinois

- **Prepared for
NL/Industries/Taracorp
Superfund Site**
- **Prepared by
ENTACT, Inc.**
- **March, 2003**



ENTACT

LEADING

THE

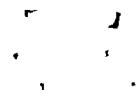
NATION

IN

CUSTOMER

CARE

**Residential
Areas &
Remote Fill
Locations**



ENTACT

environmental tactics in waste management



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1360 North Wood Dale Road

Suite A

Wood Dale, Illinois

60191

March 18, 2003

Mr. Brad Bradley
U.S. Environmental Protection Agency
Region 5
77 West Jackson Boulevard
Chicago, IL 60604 – 3590

**RE: NL/Taracorp Superfund Site
Granite City, IL
5-Year Review Project Work Plan**

Dear Mr. Bradley,

Enclosed for your review are two copies of the Project Work Plan for the 5-Year Review to be conducted at the NL/Taracorp Superfund Site in Granite City, IL.

If you have any questions regarding the Project Work Plan, feel free to contact me at 630/616-2100.

Sincerely,

Caroline Panico
ENTACT

CC: Ms. Sandra Bron/IEPA (w/enclosures)
Mr. Dennis Reis/Dennis Reis LLC (w/enclosures)
Mr. Mark Kamilow/Honeywell International (w/enclosures)
Mr. Greg Vierkant/Lucent Technologies (w/enclosures)
Mr. Ralph McMurry, Esq./Hill, Betts and Nash LLP (w/enclosures)
Mr. Jeffrey Leed/Leed Environmental, Inc. (w/enclosures)
Mr. Rich Wood/ENTACT (w/enclosures)



**5-YEAR REVIEW PROJECT WORK PLAN
NL INDUSTRIES/TARACORP
GRANITE CITY, IL**

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sampling
locations
near unremediated
yards
P.S. App B

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1.0 INTRODUCTION

In October 2002, the NL Industries/Taracorp Superfund Site Group (Group) received a request from the U.S. Environmental Protection Agency (EPA) to conduct groundwater and soil sampling at the NL Industries/Taracorp Superfund Site (NL/Taracorp Site) in Granite City, Illinois, in conjunction with EPA's five-year review. In response to EPA's request, the Group's project coordinator submitted a letter to EPA on January 21, 2003, which included a scope of work for groundwater monitoring activities at the NL/Taracorp Site. EPA approved the scope of work for groundwater monitoring in a letter issued on February 6, 2003. The Group also authorized ENTACT to prepare this Work Plan for conducting soil sampling activities and inspecting the main industrial site in conjunction with EPA's five-year review.

ENTACT has prepared this Work Plan to describe the methods to be used to collect soil samples at the remediated residential lots and remote fill areas at the NL/Taracorp Site. The Work Plan also describes the procedures to be used by ENTACT to inspect the main industrial property.

The purpose of EPA's five-year review is to evaluate the implementation and performance of the remedy at the NL/Taracorp Site to determine if the remedy remains protective of human health and the environment. If the inspection at the main industrial site confirms that the former source areas have been remediated and the cap on the Taracorp pile remains effective in controlling airborne lead emissions from the site, then the soil sampling to be performed as part of EPA's five-year review will help determine whether other sources are affecting the lead concentrations in soil at the remediated residential lots and remote fill areas.

1.1 Site Description and History

The 16-acre NL/Taracorp Site is located in a heavily industrialized section of Granite City, Illinois, a community of approximately 40,000 people, approximately two miles east of St. Louis, Missouri. The main industrial facility, located at 16th Street and Cleveland Boulevard in Granite City, operated as a secondary lead reclamation facility from 1903 until 1983. Lead acid battery breaking operations were performed in conjunction with secondary smelting activities from the 1950s until 1983. In June 1981, St. Louis Lead Recyclers, Inc. (SLLR) began to separate various components of an on-site waste pile in order to recycle lead-containing materials, hard rubber battery cases, and plastic battery cases. SLLR operations ceased in June 1983.

In December 1982, the EPA proposed to include the NL/Taracorp Site on the National Priorities List (NPL). In May 1985, NL Industries, a former owner of the site, voluntarily entered into an Agreement and Administrative Order by Consent with EPA and the Illinois Environmental Protection Agency (IEPA) to perform a remedial investigation/feasibility study (RI/FS). The site was included on the NPL in 1986. NL Industries initiated the remedial investigation in January 1987. EPA selected the remedy

for the site and issued a Record of Decision (ROD) in March 1990. To facilitate remedial activities, EPA divided the site into the following three areas of concern:

Main Industrial Properties

The main industrial properties consisted of approximately 30 acres that formerly contained the secondary lead smelting facility (NL Industries/Taracorp), a slag pile recycling operation (previously SLLR, now Trust 454), a trucking company (BV&G Transport), and a fuel oil distributor (Rich Oil). Two waste piles containing lead-contaminated materials and wastes covered portions of the area.

Adjacent Residential Lots

The residential areas were adjacent to the main industrial properties and included approximately 500 acres within the cities of Granite City, Venice, and Madison, Illinois. EPA determined that the residential areas closest to the main industrial properties had the highest levels of lead in soil, which EPA attributed to airborne dust from smelting operations.

Remote Fill Areas

The remote fill areas included properties in the Eagle Park Acres subdivisions and various Granite City residential properties, where battery case materials containing lead were used as fill and paving material in low areas. The remote fill areas also included most of the alleys in Venice Township (south and southeast of Madison), Slough Road, and Guy Street Alley in Glen Carbon, Illinois.

In October 1992, Woodward-Clyde Consultants issued a final report providing the results of soil sampling activities in the residential areas. The Army Corps of Engineers (USACE) subsequently tasked OHM Remediation Services Corp. (OHM) to remove lead-contaminated soil at various locations associated with the NL/Taracorp Site in Granite City, Venice, and Madison. The initial program contemplated the removal of lead-contaminated soil from approximately seven residential areas. However, EPA subsequently discovered additional areas of contamination during the pre-design field investigation and expanded the scope of remedial activities. OHM completed remedial activities at 738 properties from 1993 to 1998.

EPA also hired Woodward Clyde Consultants to conduct a site investigation and prepare a report providing the results of the soil sampling activities on the industrial site. EPA subsequently employed the USACE to:

- 1) Complete the remedial design and remove lead-contaminated soils and battery chips in the adjacent residential areas and remote fill areas in Granite City, Venice and Madison; and
- 2) Complete the remedial design for the Taracorp pile and industrial area.

In 1994, the EPA reopened the ROD and accepted public comments. In September 1995, EPA reaffirmed the remedial action plan, and added a groundwater containment component in a Decision Document/Explanation of Significant Differences.

In July 1998, a group of EPA-identified PRPs, collectively known as the NL/Taracorp Superfund Site Group (Group), retained ENTACT to complete remedial activities for the remaining residential lots and remote fill areas with EPA and USACE as project oversight. Later in October 1998, the Group submitted a letter to EPA naming ENTACT as its supervising contractor for remediation of the Taracorp pile and related activities at the industrial site. Following receipt of EPA's approval, the Group tasked ENTACT to perform remedial activities associated with the remediation of the Taracorp pile and related activities.

ENTACT mobilized to the site in June 1998 to begin remedial activities on behalf of the Group. The work performed by ENTACT included remedial activities associated with 802 residential lots (770 stack emission lots and 32 remote fill properties) and 21 alleys not previously completed by OHM.

The following summarizes the remedial activities conducted by ENTACT on the residential lots and remote fill areas:

- Preparation of project plans;
- Mobilization and site preparation;
- Resident coordination;
- Soil sampling and analysis;
- Excavation and removal of contaminated soil, and transportation and disposal of impacted soils;
- Paving of alleys;
- Dust suppression;
- Property restoration;
- Personnel and equipment decontamination; and
- Report preparation.

The following summarizes the remedial actions conducted by ENTACT on the main industrial property:

- Consolidation of all on-site hazardous material into the existing Taracorp pile;
- Construction of a new cell with an engineered RCRA-grade liner and a leachate collection system;
- Construction of an engineered RCRA-grade cap over the entire pile;
- Construction of stormwater and erosion controls on and around the capped pile; and
- Restoration of the site.

As described in the ROD, the completed remedy addressed the potential threats posed by the site to public health, welfare, and the environment by:

- Removing battery casings and lead-contaminated soil from residential lots and remote fill properties;
- Removing lead-contaminated soil from the main industrial site and consolidating the excavated materials onto the Taracorp pile; and
- Covering the Taracorp pile with a multi-media cap to minimize surface water infiltration and runoff-impacts and to prevent airborne dust emissions and potential recontamination of adjacent properties.

As noted above, the purpose of EPA's five-year review is to evaluate the implementation and performance of the remedy at the NL/Taracorp Site to determine if the remedy remains protective of human health and the environment. If the inspection at the main industrial site confirms that the former source areas have been remediated and the cap on the Taracorp pile remains effective in controlling airborne lead emissions from the site, then the soil sampling to be performed as part of EPA's five-year review will help determine whether other sources are affecting the lead concentrations in soil at the remediated residential lots and remote fill areas.

2.0 PROJECT ORGANIZATION AND RESPONSIBILITIES

ENTACT's project team and associated responsibilities for the implementation of the sampling and investigation activities associated with EPA's five-year review process will be as follows:

Project Manager, Rich Wood, ENTACT

Rich Wood, ENTACT's Project Manager, will have the overall responsibility for ensuring that the sampling activities are implemented and completed in accordance with the approved Work Plan, HASP and federal, state, and local regulations. In addition, he will ensure that ENTACT provides the appropriate personnel and equipment necessary to complete the work.

Corporate Health and Safety Officer, Don Self, ENTACT

Don Self, ENTACT's Corporate Health and Safety Officer, will coordinate and provide guidance for health and safety activities at the site. He will be responsible for conducting the health and safety orientation meeting before work begins, reviewing weekly health and safety updates from the site, and conducting periodic health and internal safety audits.

Technical and Regulatory Support, Caroline Panico, ENTACT

Caroline Panico, ENTACT's Technical and Regulatory Support, will be responsible for ensuring that approved sampling and analytical procedures for this project are followed, for reviewing analytical data as it is received from the approved laboratory, and conducting periodic reviews of field documentation procedures and sampling data.

Quality Assurance/Quality Control Officer, Joe Cronk and Heather Alcorn, ENTACT

Joe Cronk and Heather Alcorn, ENTACT's QA/QC Officers, will be responsible for performing required sampling and quality control testing at the site. The QA/QC Officers will ensure compliance with the Work Plan and attached Sampling and Analysis Plan, and HASP. Specific responsibilities include:

- Securing necessary sampling tools, bottles, packaging/shipping supplies, and chain-of-custody documents;
- Collecting and shipping samples at the designated frequencies for laboratory analysis parameters specified in the Sampling and Analysis Plan;
- Documenting the location, time, and date that samples are collected and shipped to the laboratory; and
- Obtaining analytical results and reporting the data to ENTACT's Project Manager.

Senior members of ENTACT's Technical and Regulatory Support staff will be providing oversight and assistance during sampling activities to ensure the Work Plan and Sampling and Analysis Plan procedures are being properly implemented. An ENTACT QA/QC technician will be assigned the task of coordinating sample preparation for laboratory analysis and tracking the analytical results.

Off-Site Laboratory

The laboratory that will analyze soil samples collected from the residential lots and remote fill properties for this project is:

Environmetrics, Inc.
11401 Moog Dr.
St. Louis, Missouri 63146
(314) 432-0550

3.0 PROJECT ACTIVITIES

The following sections describe in detail the activities that will be implemented to achieve the project objectives.

3.1 Submittal Preparation

ENTACT will prepare the following documents as part of this project:

- Work Plan for Soil Sampling;
- Access Agreement (Appendix A to Work Plan);
- Sampling and Analysis Plan (Appendix B to Work Plan);
- Health and Safety Plan (HASP);
- O&M Inspection Log (Appendix C to Work Plan); and
- Final Report.

3.2 Mobilization and Preparation Activities

Upon receipt of Work Plan approval from EPA, ENTACT will schedule the work and mobilize multiple teams of QA/QC technicians to perform the sampling activities. Each team will consist of a minimum of two technicians and appropriate sampling equipment.

3.3 Access Agreements

Prior to commencing soil-sampling activities, ENTACT personnel will obtain an agreement signed by the property owner granting access to the property. The signed access agreements will be maintained in the project files for each property. Copies of the signed access agreements will be included in the Final Report.

ENTACT representatives will initiate efforts to secure access from the property owners upon mobilization to the site. If the owner of a selected property does not grant access, ENTACT will attempt to secure access to the next closest remediated property.

A copy of a sample access agreement is included as Appendix A to this Work Plan.

3.4 Soil Sampling

To select the properties to be sampled, the ENTACT technical group reviewed maps and databases for the stack emissions residential lots and remote fill lots generated during the previously conducted remedial activities. A percentage of each sample type will be collected in each of the four quadrants (northeast, southeast, northwest and southwest) starting at locations adjacent to the NL Industries/Taracorp cap and radiating outward. The number of samples collected in each of the four quadrants is proportional to the number of properties that were originally remediated in that quadrant. This selection method should result in a representative group of properties being sampled that will be indicative of current conditions. Figure 1 shows the location of the main industrial site (including the Taracorp pile), the four quadrants, and the residential lots that have been

selected for sampling. The remote fill lots, which were located in the Eagle Park Acres subdivision and which are proposed for sampled, are not shown on Figure 1 but are identified on Table 1. Table 1 lists the actual property addresses and quadrant location for each residential lot shown on Figure 1 as well as the remote fill properties that have been selected for sampled.

Based on the maps and databases, 40 of the 1,508 remediated residential lots representing 2-3% of the total residential lots remediated by OHM and ENTACT, have been selected for the five-year review-sampling event. In addition to the remediated residential lots, ENTACT will sample 5 residential lots located immediately adjacent to residential lots that were not remediated because the owner of the property denied access for soil sampling and/or remedial activities. This sampling event will be performed to determine if the non-remediated residential lots are impacting adjacent properties.

Remediated remote fill areas were selected for sampling using the same process as with the residential lots. 5 of the 53 remote fill areas were chosen for inclusion in the sampling event. Remote fill properties will only be sampled in areas of the property where remedial action was performed.

Residential lots and remote fill areas will be sampled in accordance with the Sampling and Analysis Plan included as Appendix B to this Work Plan.

3.5 Industrial Property Inspection

ENTACT will inspect the main industrial property and note the condition of the following items:

- The integrity of the cap cover material and vegetation;
- The concrete drainage channels around the perimeter of the cap;
- The access road and stormwater drainage ditches;
- The six-foot perimeter fence; and
- The leachate collection system

The items to be inspected are described in additional detail in the June 2002 Operation and Maintenance Plan. The results of the industrial property inspection will be documented on the O&M Inspection Log (Appendix C) and will be described in additional detail in the Final Report prepared by ENTACT.

4.0 RECORD KEEPING AND REPORTING

4.1 Daily Record Keeping

Logs of daily activities performed by ENTACT will be used to record sampling activities. The field logbooks to be used will be bound and have consecutively numbered pages. Entries in the field logbook will be made in waterproof ink and will include: the name of the author; date and time of entry; location of activity; sample collection or measurement methods; number of samples collected; sample identification numbers; field observation and comments; sampling depth increment for soils; field measurements; locations of photographs; and any deviations from the sampling plan. The field logbooks will be maintained by ENTACT's field personnel and stored in the document control center at the job site when it is not in use. Upon project completion, all logbooks will become part of the file records.

4.2 Monthly Progress Reports

The status of ENTACT's work at the site will be summarized in progress reports that will be submitted to EPA on a monthly basis by the Group's project coordinator.

4.3 Data Review with EPA

After laboratory testing has been completed and before the Final Report is submitted to EPA, ENTACT's project manager and the Group's project coordinator will discuss the laboratory data with EPA's project manager. The following items will be discussed:

- The results of the inspection of the main industrial property, including the integrity of the Taracorp pile cap (and whether the cap remains effective in preventing releases of airborne lead-containing materials to adjacent properties);
- The results of laboratory testing of soil samples (and whether the concentration of lead-in-soil exceeds EPA's performance standard); and
- If EPA's performance standard is exceeded for any of the samples, whether the data could be attributable to factors that are unrelated to the NL/Taracorp site such as:
 - Proximity to roadways;
 - Proximity to properties that were not remediated because the property owner denied access for cleanup;
 - Lead-based paint impacts; or
 - Proximity to other potential lead sources.

The results of the discussion will be summarized in the Final Report. The Group understands that EPA may be obligated to conduct additional studies without participation from the Group if the sampling results indicate impacts to the soil that are unrelated to former activities at the NL/Taracorp site.

4.4 Final Report

Upon completion of soil sampling activities, the industrial property inspection, and laboratory testing of soil samples, ENTACT will prepare a Final Report documenting findings and analytical results. Specifically, the Final Report will include the following:

- Description of soil sampling and analytical procedures;
- Tabulated summary of analytical results;
- Analytical reports;
- Diagrams of residential properties and remote fill areas that were sampled;
- Access agreements signed by the property owners;
- Inspection results for the main industrial site; and
- Discussion of results.

5.0 HEALTH & SAFETY

ENTACT's Health and Safety Officer will prepare a project-specific HASP before mobilization of the ENTACT crew to the site. The HASP will be prepared in accordance with ENTACT's Corporate health and safety policies, Occupational Safety and Health Administration ("OSHA") Title 29 CFR Part 1910, and Section 01129 of the remedial design specifications.

Prior to the initiation of work, all field team members will be required to read and familiarize themselves with the HASP. A mandatory health and safety meeting will be held with the project field team to discuss the history of the site and potential contaminants of concern, potential health and safety issues associated with the project, required level of personal protective equipment, and the procedure for personnel and sampling equipment decontamination.

Daily safety meetings will be held, as required by ENTACT's Corporate Health and Safety Policy and in accordance with the HASP for the site. The daily meetings will include discussions of the work to be performed that day, the responsibilities of the field team members, and potential health and safety issues.

6.0 PROJECT SCHEDULE

Upon receipt of EPA's approval of this Work Plan and authorization to proceed, ENTACT will mobilize to the site and initiate efforts to obtain access for soil sampling activities. At the present time, ENTACT anticipates that approximately 1 to 2 weeks will be required at the site to obtain access agreements and collect soil samples. ENTACT anticipates that a Final Report will be submitted to EPA within 6 weeks after the soil samples have been collected and analyzed.



ENTACT

Tables

Tables

Table 1
NL Industries/Taracorp Superfund Site
Properties to be Sampled

Property #	Property Type	Address	City	Sampling Quadrant
1	Residential Lot	1619-21 Edison	Granite City	NE
2	Residential Lot	1736 Cleveland	Granite City	NE
3	Residential Lot	1700 Edison	Granite City	NE
4	Residential Lot	1821 Edison	Granite City	NE
5	Residential Lot	1821 Madison	Granite City	NE
6	Residential Lot	1939 Benton	Granite City	NE
7	Residential Lot	1928 State	Granite City	NE
8	Residential Lot	2059 Cleveland	Granite City	NE
9	Residential Lot	2023 Cleveland	Granite City	NE
10	Residential Lot	2032 Washington	Granite City	NE
11	Residential Lot	2135 Edison	Granite City	NE
12	Residential Lot	2107 Monroe	Granite City	NE
13	Residential Lot	2220 Adams	Granite City	NE
14	Residential Lot	2201-03 Grand	Granite City	NE
15	Residential Lot	2253 Lee	Granite City	NE
16	Residential Lot	2317 Cleveland	Granite City	NE
17	Residential Lot	2304 Iowa	Granite City	NE
18	Residential Lot	2432 Edison	Granite City	NE
19	Residential Lot	2133 Missouri	Granite City	NE
20	Residential Lot	1750 Maple	Granite City	NW
21	Residential Lot	1820 Spruce	Granite City	NW
22	Residential Lot	1903 Spruce	Granite City	NW
23	Residential Lot	2032 Bryan	Granite City	NW
24	Residential Lot	2220 Ohio	Granite City	NW
25	Residential Lot	2610 Denver	Granite City	NW
26	Residential Lot	2701 Cayuga	Granite City	NW
27	Residential Lot	623 Meredocia	Venice	SW
28	Residential Lot	528 Meredocia	Venice	SW
29	Residential Lot	918 Grand	Madison	SW
30	Residential Lot	1200 State	Madison	SW
31	Residential Lot	1438 Grand	Madison	SE
32	Residential Lot	1430 Madison	Madison	SE
33	Residential Lot	1416 Washington	Madison	SE
34	Residential Lot	1315 Iowa	Madison	SE
35	Residential Lot	1227 Madison	Madison	SE
36	Residential Lot	1233 Meridian	Madison	SE
37	Residential Lot	1027 Iowa	Madison	SE
38	Residential Lot	918 Alton	Madison	SE
39	Residential Lot	722 Washington	Madison	SE
40	Residential Lot	1126 Reynolds	Madison	SE
41	Adjacent to Access Denied	1641 Delmar	Granite City	NE
42	Adjacent to Access Denied	1718 Edison	Granite City	NE
43	Adjacent to Access Denied	2222 Edison	Granite City	NE
44	Adjacent to Access Denied	1733 Maple	Granite City	NW
45	Adjacent to Access Denied	1732 Olive	Granite City	NW

Table 1
NL Industries/Taracorp Superfund Site
Properties to be Sampled

Property #	Property Type	Address	City	Sampling Quadrant
46	Remote Fill Lot*	115 Booker	Granite City	NA
47	Remote Fill Lot*	210 Roosevelt	Granite City	NA
48	Remote Fill Lot*	212 Hill	Granite City	NA
49	Remote Fill Lot*	91 Harrison	Granite City	NA
50	Remote Fill Lot*	213 Watson	Granite City	NA

* Remote fill lots are located in the Eagle Park Acres subdivision not shown on Figure 1



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Figures

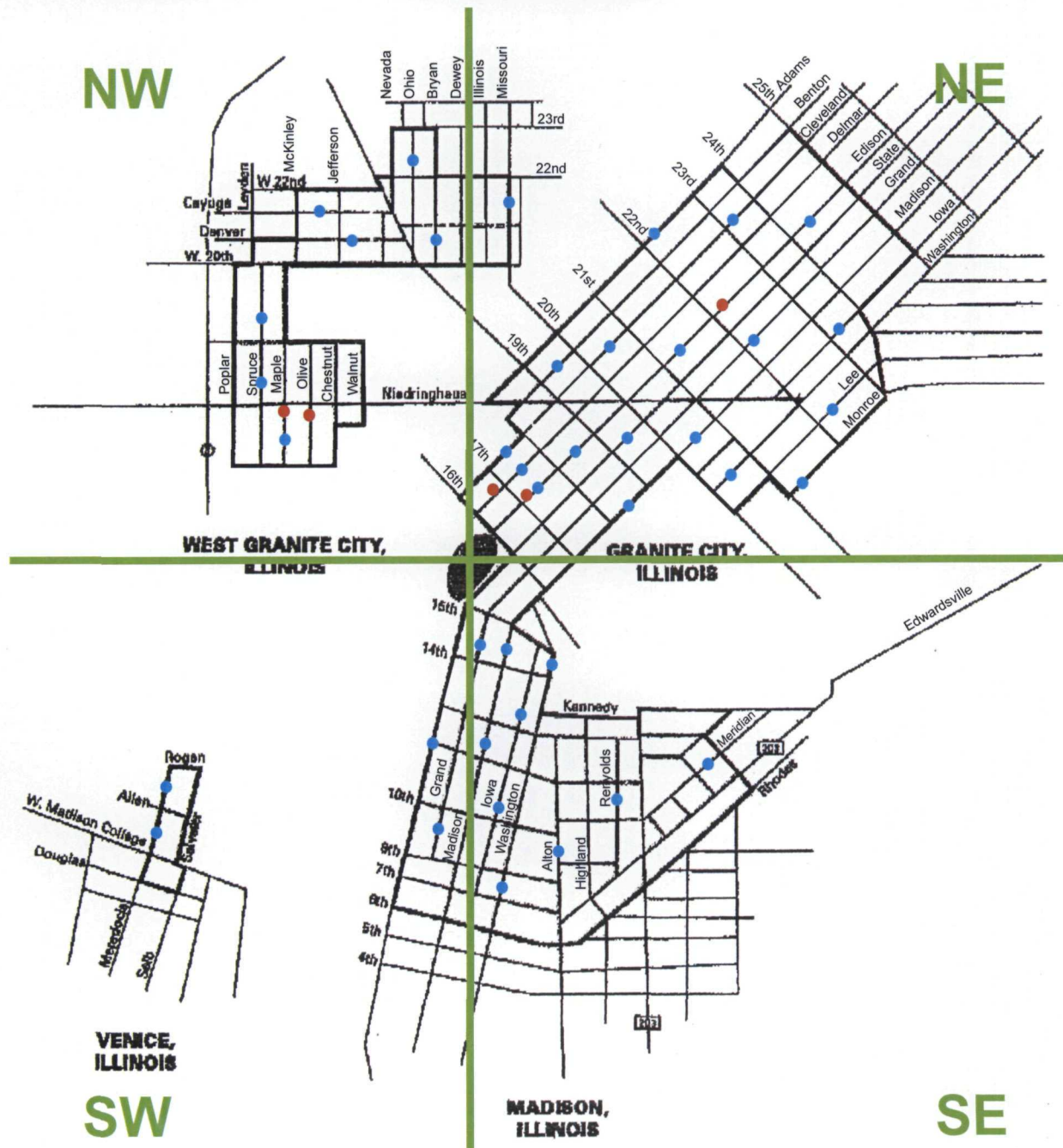
Figures

adjacent to 1731 Chestnut
 1643 Delmar
 1427 Madison
 1730 Maple
 437 Grand
 1731 Maple

FIGURE 1

NL Taracorp Superfund Site

Residential Lots To Be Sampled



Legend

- Remediated Residential Lots
- Adjacent to Denied Access Properties
- Taracorp Pile



0 1000 2000
 Approximate Scale in Feet



ENTACT

Appendix

A

Appendix A

Appendix A

Sample Access Agreement

CONSENT FOR ACCESS TO PROPERTY

Name: _____ Daytime phone number: _____

Address(es) of Property/Properties: _____

I consent to allowing authorized representatives of the NL/Taracorp Superfund Site Group (Group), its authorized representatives and contractors, the United States Environmental Protection Agency (EPA), its authorized representatives and contractors, and the State of Illinois, its authorized representatives and contractors, to enter and have continued access to my property for the purpose of sampling **soil lead levels** in conjunction with EPA's Comprehensive 5-Year Review Process for the NL/Taracorp Superfund Site.

The purpose of the EPA 5-Year Review is to evaluate the implementation and performance of the selected remedy to determine if the remedy remains protective of human health and the environment.

This written permission is given voluntarily with knowledge of its right to refuse and without threats or promises of any kind. I understand that if there is any damage to structures such as sidewalks that is caused by the work conducted by the Group or its authorized representatives and contractors, then the Group and its authorized representatives and contractors shall repair such damage.

Date

I grant access to my property

I do not grant access to my property

Signature

Signature

Please return as soon as possible using the self-addressed, stamped envelope addressed to ENTACT, Inc., 1360 N. Wood Dale Road, Wood Dale, IL 60191. If you have any questions please contact Mr. Rich Wood at (630)616-2100..



ENTACT

Appendix B

Appendix B

Sampling and Analysis Plan

**5-YEAR REVIEW PROJECT WORK PLAN
NL INDUSTRIES/TARACORP
GRANITE CITY, IL**

**APPENDIX B
SAMPLING AND ANALYSIS PLAN**

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1.0 INTRODUCTION

ENTACT has prepared this Sampling and Analysis Plan (SAP) in conjunction with the Work Plan to ensure that sample collection activities performed as part of EPA's five-year review are conducted at the NL Industries/Taracorp Superfund Site (NL/Taracorp Site) in Granite City, Illinois in accordance with technically accepted protocols. This SAP describes the sampling procedures to be used for:

- Soil sample collection from residential properties; and
- Soil sample collection from remote fill areas.

All ENTACT personnel performing field sampling activities will comply with the site-specific Health and Safety Plan (HASP) during the execution of the sampling event.

1.1 Site Description and History

The 16-acre NL/Taracorp Site is located in a heavily industrialized section of Granite City, Illinois, a community of approximately 40,000 people, approximately two miles east of St. Louis, Missouri. The main industrial facility, located at 16th Street and Cleveland Boulevard in Granite City, operated as a secondary lead reclamation facility from 1903 until 1983. Lead acid battery breaking operations were performed in conjunction with secondary smelting activities from the 1950s until 1983. In June 1981, St. Louis Lead Recyclers, Inc. (SLLR) began to separate various components of an on-site waste pile in order to recycle lead-containing materials, hard rubber battery cases, and plastic battery cases. SLLR operations ceased in June 1983.

In December 1982, the EPA proposed to include the NL/Taracorp Site on the National Priorities List (NPL). In May 1985, NL Industries, a former owner of the site, voluntarily entered into an Agreement and Administrative Order by Consent with EPA and the Illinois Environmental Protection Agency (IEPA) to perform a remedial investigation/feasibility study (RI/FS). The site was included on the NPL in 1986. NL Industries initiated the remedial investigation in January 1987. EPA selected the remedy for the site and issued a Record of Decision (ROD) in March 1990. To facilitate remedial activities, EPA divided the site into the following three areas of concern:

Main Industrial Properties

The main industrial properties consisted of approximately 30 acres that formerly contained the secondary lead smelting facility (NL Industries/Taracorp), a slag pile recycling operation (SLLR, now Trust 454), a trucking company (BV&G Transport), and a fuel oil distributor (Rich Oil). Two waste piles containing lead-contaminated materials and wastes covered portions of the area.

Adjacent Residential Lots

The residential areas were adjacent to the main industrial properties and included approximately 500 acres within the cities of Granite City, Venice, and Madison, Illinois. EPA determined that the residential areas closest to the main industrial properties had the highest levels of lead in soil, which EPA attributed to airborne dust from smelting operations.

Remote Fill Areas

The remote fill areas included properties in the Eagle Park Acres subdivisions and various Granite City residential properties, where battery case materials containing lead were used as fill and paving material in low areas. The remote fill areas also included most of the alleys in Venice Township (south and southeast of Madison), Slough Road, and Guy Street Alley in Glen Carbon, Illinois.

In October 1992, Woodward-Clyde Consultants issued a final report providing the results of soil sampling activities in the residential areas. The Army Corps of Engineers (USACE) subsequently tasked OHM Remediation Services Corp. (OHM) to remove lead-contaminated soil at various locations associated with the NL/Taracorp Site in Granite City, Venice, and Madison. The initial program contemplated the removal of lead-contaminated soil from approximately seven residential areas. However, EPA subsequently discovered additional areas of contamination during the pre-design field investigation and expanded the scope of remedial activities. OHM completed remedial activities at 738 properties from 1993 to 1998.

EPA also hired Woodward Clyde Consultants to conduct a site investigation and prepare a report providing the results of the soil sampling activities on the industrial site. EPA subsequently employed the USACE to:

- 1) Complete the remedial design and remove lead-contaminated soils and battery chips in the adjacent residential areas and remote fill areas in Granite City, Venice and Madison; and
- 2) Complete the remedial design for the Taracorp pile and industrial area.

In 1994, the EPA reopened the ROD and accepted public comments. In September 1995, EPA reaffirmed the remedial action plan, and added a groundwater containment component in a Decision Document/Explanation of Significant Differences.

In July 1998, a group of EPA-identified PRPs, collectively known as the NL/Taracorp Superfund Site Group (Group), retained ENTACT to complete remedial activities for the

remaining residential lots and remote fill areas with EPA and USACE as project oversight. Later in October 1998, the Group submitted a letter to EPA naming ENTACT as its supervising contractor for remediation of the Taracorp pile and related activities at the industrial site. Following receipt of EPA's approval, the Group tasked ENTACT to perform remedial activities associated with the remediation of the Taracorp pile and related activities. ENTACT completed remedial activities at the main industrial property and at various residential lots and remote fill locations adjacent to the main industrial site on behalf of the Group. Remedial activities performed by ENTACT on the main industrial property consisted of the excavation of lead-impacted material exceeding 1,000 mg/kg, consolidation of the excavated materials into the Taracorp pile, construction of an engineered RCRA-grade cell and cap on the Taracorp pile, installation of a leachate collection system, stormwater controls, site restoration, and construction of a permanent site security fence.

In the areas adjacent to the main industrial site, ENTACT removed lead-impacted soil exceeding 500 mg/kg from residential lots and remote fill areas. Residential lots had lead concentrations in the surface soil that EPA attributed to stack emissions from the main industrial facility. Remote fill areas consisted of properties where battery cases containing lead were used as fill material.

The excavated materials were either disposed off-site or placed into the Taracorp pile before the pile was capped as part of remedial activities for the industrial portion of the site. In June 1998, ENTACT began the residential remedial activities associated with 767 residential lots and 32 remote fill properties. Prior to ENTACT's work at the site, 738 residential properties were remediated by OHM from 1993 to 1998.

1.2 Statement of Objectives

The following objectives will be achieved during soil sampling activities to be performed by ENTACT as part of EPA's five-year review at the NL/Taracorp Site:

- Perform Residential Soil Sampling
 - Collect soil samples from 40 remediated residential properties
 - Collect soil samples from 5 remediated residential properties located immediately adjacent to non-remediated residential properties where the owner of the non-remediated property denied access for soil sampling and/or remedial activities
- Perform Remote Fill Area Sampling
 - Collect soil samples from 5 remote fill areas
- Laboratory Testing of Soil Samples for Total Lead
- Report Preparation and Submittal
 - Tabulated summary of data

- Analytical reports
- Property diagrams
- Discussion of results

The purpose of EPA's five-year review is to evaluate the implementation and performance of the remedy at the NL/Taracorp Site to determine if the remedy remains protective of human health and the environment. If the inspection at the main industrial site confirms that the former source areas have been remediated and the cap on the Taracorp pile remains effective in controlling airborne lead emissions from the site, then the soil sampling to be performed as part of EPA's five-year review will help determine whether other sources are affecting the lead concentrations in soil at the remediated residential lots and remote fill areas.

2.0 SAMPLING ACTIVITIES

2.1 Residential Properties

Soil samples will be collected from 40 residential properties (representing 2-3% of the total number of remediated residential properties) and analyzed for total lead. Three composite soil samples will be collected at each property.

One composite sample will be collected from the front yard and one composite sample will be collected from the back yard. Each front-yard and back-yard composite sample will consist of five sample aliquots with one aliquot collected at each of the four corners of the area to be sampled and one collected near the center of the area to be sampled. Each sample will be collected at a depth of 0-3 inches below the ground surface.

At EPA's request, a four-point composite sample will also be collected at each residential property within the drip zone of each home to assess whether the lead concentrations in the soil are related to the lead concentrations in paint on the homes. At each residential property being sampled, an aliquot of soil will be collected from the drip zone on each side of the home. Each aliquot will be collected at a depth of 0 – 3 inches below the ground surface. The four aliquots will be combined to form one composite drip zone soil sample for each residential property.

2.2 Remote Fill Areas

Soil samples will be also collected from 5 remote fill areas, which were properties where battery chips were formerly used as fill material. These soil samples will also be analyzed for total lead.

For remote fill lots less than 150 feet x 50 feet, a 5-point composite sample will be collected from both the front and back yards of each property in the manner described in Section 2.1 for residential properties. Remote fill lots greater than 150 feet x 50 feet will be divided into 50 feet x 50 feet sampling grids. A 5-point composite sample will be collected from each of the grids at a depth of 0-3 inches below the ground surface. Samples will only be collected from the grids or yards of remote fill properties that were remediated during previous work at the site.

3.0 SAMPLING PROCEDURES

The procedures to be used by ENTACT QA/QC personnel during soil sampling activities are provided in Sections 3.1 – 3.5.

3.1 Sample Collection

ENTACT personnel will use the following equipment and supplies to collect soil samples at each residential property and remote fill lot:

- Stainless steel or plastic disposable scoops or trowels;
- Stainless steel bowl;
- Sample containers and Ziploc plastic bags;
- Field notebook; and
- Decontamination supplies (decontamination will be conducted at the sample location)

Soil aliquot (grab) samples will be collected using a stainless steel or plastic disposable scoop or trowel at each sampling location. The soil aliquot samples at each sampling location will be placed in a Ziploc bag to form a composite sample at each sampling location. The Ziploc bag will be properly labeled with the property name/identification, sample location (including front yard, back yard, drip zone, etc.), sample depth, time, date and initials of sampler. Field notes will be recorded for each sample taken and will include soil description (color, type, and foreign material) and any other pertinent observations relating to the sample or conditions at the time of sampling. Field notes will include a sketch of the property showing the locations at which soil aliquot samples are collected.

The bagged samples will be transported to a centrally located sample managing area. The composite samples for each sample location will be transferred to a decontaminated stainless steel bowl and thoroughly mixed to achieve a homogenous blend. Vegetative material and rocks will be removed from the bowl. The homogenized sample will then be placed in an appropriate sample container, and a sample identification number will be assigned in accordance with the sample identification system described below. A sample label will be prepared and affixed to the sample container to identify sample number, sampler's name, date and time of collection, sampling location, and project identification data.

The samples will be submitted to the designated laboratory, Environmetrics, Inc., St. Louis Missouri, for total lead analysis using DQO Screening Level 4 to provide the appropriate level of quality assurance data.

3.2 Sample Identification System

A sample identification system will be implemented in order to properly track the samples from sampling activities through the completion of laboratory analysis. Examples of the identification coding system for each type of soil sample are listed in the following table:

Sample Type	Identification System
Soil Samples:	
Residential Properties Remote Fill Areas (< 7,500 ft ²) Remote Fill Areas (>7,500 ft ²)	RP-Property Address-BY, FY, or DZ RF-Property Address-BY, FY, or DZ RF-Property Address-Grid #
Quality Control Samples:	
Field Duplicate Samples for Soil	Sample ID + FD
Field Rinsate Blanks (<i>if re-usable equipment is used</i>)	FB-000

In general, all numbering sequences shown above with "000" will begin with the number "001" and will continue upward by one unit (i.e., X-001, X-002, X-003, etc.) until the final sample for that sample type has been collected.

Residential property soil samples will be numbered to indicate the type of property (i.e. residential or remote fill), the property street address, and the specific sample location within the property. For each residential property, a composite sample (5 aliquots) will be collected from 0 – 3 inches from the front yard (FY), a composite sample (5 aliquots) will be collected from 0 – 3 inches from the back yard (BY), and a composite sample (4 aliquots) will be collected from 0 – 3 inches from the drip zone (DZ) on each side of the home. For example, a composite sample collected from the back yard of a residential property located at 123 Main will be identified as RP-123 Main-BY.

For remote fill areas less than 150 feet by 50 feet (less than 7,500 square feet) in size, a composite sample (5 aliquots, each collected at a depth of 0 – 3 inches) will be collected from the front yard and the back yard. The sample numbers for the remote fill properties will include the property address and the specific sample location within the property. For example, a composite sample collected from the back yard of a remote fill property located at 123 Main will be numbered RF-123 Main-BY.

For remote fill areas greater than 150 feet x 50 feet (greater than 7,500 square feet) in size, the property will be divided into 50 feet by 50 feet grids. A composite sample (5 aliquots) will be collected from each of the grids at a depth of 0 – 3 inches below the surface. The sample numbers for these larger properties will include the grid number after the sample location. For example, a composite sample collected at remote fill property located at 123 Main from grid # 4 in the back yard will be numbered RF-123 Main-BY4.

A diagram will be prepared for each residential property and remote fill lot showing a general layout of the property and description of relevant features of the property such as structures, trees, gardens, etc. The diagram will also show the locations where each aliquot sample was collected.

Sample identification documents will be carefully prepared to maintain identification and Chain-of-Custody (COC) records, and to control sample disposition. Components of the field documentation procedures include the use of field logbooks, sample labels, and the COC forms. Original data recorded in field logbooks, COC records, and other forms will be written in waterproof ink. None of these documents will be altered, destroyed, or discarded, even if they are illegible or contain inaccuracies that require a replacement document. If an error is made on a document assigned to one individual, that individual will make the corrections by placing a line through the error, entering the correct information, and initialing and dating the change. Samples and documentation will be maintained and handled by as few people as possible.

3.3 Sample Equipment Decontamination

Sample equipment decontamination will be performed at the sample location to minimize the potential for sample cross-contamination. Reusable sampling equipment used during sampling activities will be decontaminated prior to each use. All reusable sampling equipment (e.g., trowels, bowls) will be decontaminated using the following four-step process:

- 1) All visible large debris will be manually removed from the used sampling tool.
- 2) The tool will be washed in a plastic pail using an Alconox detergent/potable water solution.
- 3) After the detergent wash, the tool will be rinsed with potable water over a plastic pail.
- 4) The tool will be rinsed again but with distilled water and air-dried or dried with disposable paper towels.

After decontamination, the sampling equipment will be dried with disposable towels and

stored in plastic sampling toolboxes between sampling events. All decontaminated equipment within the sampling toolbox will be placed in individual plastic bags or wrapped in disposable towels. The sampling toolboxes will also be decontaminated and at the end of each day to ensure cleanliness.

3.4 Sample Chain-of-Custody Procedures

A COC form will be filled out at the time of sample preparation. COC procedures serve to minimize loss or misidentification of samples and to ensure that unauthorized persons do not tamper with collected samples.

Information to be recorded on the COC form provided by the laboratory includes sample identification, sample description, name(s) of sampler(s), and requested analyses. The COC form will be placed in a sealed plastic bag for protection and will accompany the associated samples to the laboratory. When the sample custodian changes, the person relinquishing the samples will sign the COC form and note the date and time of transfer. The person receiving the samples will also sign the COC form and note the date and time of receipt.

3.5 Sample Handling Procedures

Samples will be packaged for shipping in such a manner as to prevent damage or breakage during shipment or transport. Sample labels will be filled out at the time of placement of the sample into the container and will be affixed to each container to identify sample number, sampler's name, date and time of collection, location of sampling point, and project identification data.

Samples will be placed into suitable containers, labeled and sealed in such a manner that tampering with the seal would be obvious. All sample holding times will be tracked and a copy of the COC form will accompany the samples in a sealed plastic bag. Samples not hand delivered to the laboratory will be shipped through an overnight parcel service. Shipment of samples to the laboratory will take place on the same day as collection. The COC form will be enclosed in a sealed plastic bag and placed inside the sealed cooler. If the samples are sent by common carrier, a bill of lading will be used to document the custody of the sample while in transit. Commercial carriers are not required to sign the COC forms as long as the forms are sealed inside the cooler.

4.0 DATA QUALITY OBJECTIVES

All soil samples will be analyzed for total lead in accordance with EPA Method SW-6010B. A Level 4 Data Quality Objective (DQO) will be used for all soil samples. This DQO level will provide the highest level of data quality which will be beneficial for evaluating the effectiveness of the remedy. This procedure requires full analytical and data validation procedures in accordance with EPA recognized protocol.

4.1 Field Quality Control Samples

Field quality control (QC) samples will be collected to assess the quality of the analytical data and to evaluate sampling and analytical reproducibility (precision). Field quality control samples will consist of duplicate samples and field blanks.

Field Duplicates

Field duplicate samples will be collected for soil samples at a rate of one duplicate for every ten composite samples collected. At the sample location where a duplicate sample will be collected, an ample volume of soil will be placed in a Ziploc plastic bag to ensure that a sufficient volume of soil is available for laboratory testing of the soil sample and the field duplicate sample for total lead. The field duplicate sample will be labeled as "Sample Identification" + FD. The QA/QC technicians will select locations in the field where duplicate samples will be collected.

Field Blanks

If reusable-sampling equipment (i.e. stainless steel bowl and/or trowel) is used, a field blank sample will be prepared at a rate of one rinsate sample for every 10 soil samples to assess potential procedural errors in sampling or sample handling. Field blank samples will be taken by pouring distilled water over the decontaminated sampling equipment. Field blank samples will be labeled as FB-000 and continue sequentially. Field blank samples will be submitted to the laboratory for total lead analysis.

Matrix Spike/Matrix Spike Duplicates

Matrix Spike/Matrix Spike Duplicates (MS/MSD) samples will be performed at a rate of one for every 20 soil samples analyzed by the laboratory. No extra sample volume is required for the MS/MSD samples for metals. The MS/MSD will be performed at a rate of one per twenty investigative samples.

4.2 Detection Limit Requirements

Total lead data will be reported on a dry weight basis. The laboratory will be able to attain limits of quantitation well below the cleanup criterion of 500 mg/kg total lead.

5.0 FIELD DOCUMENTATION

5.1 Field Logbooks

The QA/QC technician will document all field-sampling activities in a field logbook. Sample logbooks will be bound and have consecutively numbered pages. Entries in the field logbook will be made in waterproof ink and will include:

- Name of the sampler;
- Date and time of entry;
- Location of activity;
- Sample collection or measurement methods;
- Number of samples collected;
- Sample identification numbers;
- Field observation and comments;
- Sampling depth increment for soils;
- Field measurements and drawings;
- Any deviations from the Sampling and Analysis Plan.

The field logbook will be stored in a controlled area it is not in use. Upon project completion, all logbooks will become part of the file records.

5.2 Sample Database

All samples collected will be compiled in a sample database to be updated by the QA/QC Officers on a daily basis. The sample-tracking database will include the following information:

- Sample identification;
- Sample collection date;
- Chain of Custody Number;
- Sampling location; and
- Brief description of the location based on established reference points.

Upon receipt of analytical results, the sampler will cross-reference the laboratory batch number with the sample identification in the sample-tracking log.



ENTACT

Appendix C

Appendix C

O&M Inspection Log

**NL/TARACORP SITE
O&M INSPECTION LOG**

Inspector's Name: _____

Date of Inspection: _____

Site Structure	Inspected (Yes/No)	Inspection Observations	Maintenance Work Required or Performed
Security Fence:			
• Gates/locks secure and operative			
• Evidence of rust, cuts, deterioration			
• Evidence of unauthorized entry			
• Burrowing or tunneling under fence			
• Damaged barbed wire			
• Comments			
Access Road:			
• Evidence of settlement or deterioration			
• Comments			
Landfill Cover – Vegetation:			
• Establishment of grass from initial seeding			
• Adequate growth of vegetation			
• Evidence of stress			
• Presence of trees/shrubs			
• Need for mowing/maintenance			
• Comments			
Landfill Cover – Erosion:			
• Evidence of erosion			
• Indicate areal extent and location			
• Comments			
Landfill Cover – Settlement:			
• Evidence of settlement			
• Indicate areal extent and location			
Landfill Cover – Cracks:			
• Evidence of cracks			
• Indicate areal extent and location			
• Comments			
Landfill Cover – Bulges:			
• Evidence of bulges			
• Indicate areal extent and location			
Landfill Cover – Ponding:			
• Evidence of ponding			

NL/TARACORP SITE
O&M INSPECTION LOG (continued)

Site Structure	Inspected (Yes/No)	Inspection Observations	Maintenance Work Required or Performed
• Indicate areal extent and location			
• Comments			
Landfill Cover – Seeps:			
• Evidence of seepage (leachate)			
• Indicate areal extent and location			
• Comments			
Landfill Cover – Slope Stability:			
• Evidence of sliding			
• Indicate areal extent and location			
• Comments			
Leachate Management System:			
• Riser pipe and locks			
• Leachate levels in sump			
• Necessary sampling activities			
• Necessary leachate disposal			
• Comments			
Concrete Drainage Channel:			
• Evidence of cracks or obstructions			
• Areas of erosion			
• Comments			
Asphalt Covers – Integrity:			
• Evidence of broken asphalt or fissures			
• Indicate areal extent and location			
• Comments			